Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

ASTRONOMICAL DETERMINATION OF THE TIME OF THALES.

By F. P. MATZ, Sc. D., Ph. D., Professor of Mathematics and Astronomy in Irving College, Mechanicsburg, Pennsylvania.

According to Pliny, the *cosmical setting* of the Pleiades, during the time of Thales of Miletus, occurred twenty-five days after the Vernal Equinox.

The geographical latitude of Miletus is $\lambda=+37^\circ\ 30'$. The brightest star of the Pleiades is η *Tauri*, popularly known as *Alcyone*. The apparent place for upper transit of η Tauri, at Washington, for the Mean Solar Date, January 9.3, 1895, is, according to Professor Simon Newcomb, characterized by a *Right Ascension*, $\alpha=3h.\ 41m.\ 15.49s.$, and by a *Declination*, $\delta=+23^\circ\ 47'\ 0''.4$.

From these data the hour-angle of η Tauri is determined to be $h=109^\circ\ 45'\ 54''.6,=7h.\ 19m.\ 3.64s.$ Hence the *sidereal time* of the *rising* of η Tauri is $T_r=20h.\ 22m.\ 11.85s.$, and *that* of the *setting* is $T_s=11h.\ 0m.\ 19.13s.$; that is, η Tauri is $T=14h.\ 38m.\ 7.28s.$ of sidereal time above the horizon.

This problem can now be solved in four different ways; and possibly the most expeditious method of *mathematical* solution, is to make $T_s=(180^\circ-\Theta)=165^\circ\ 4'\ 46''.95$. Therefore $\Theta=14^\circ\ 55'\ 13''.05$.

By a calculation analogous to that in our second solution of the "Dog-Star Problem," we find $\frac{1}{2}(Z+V)=87^\circ\ 27'\ 17''.81$, and $\frac{1}{2}(Z-V)=68^\circ\ 54'\ 20''.94$. Therefore, $Z=156^\circ\ 21'\ 38''.75$, and $V=18^\circ\ 32'\ 56'.87$; and $VZ=39^\circ\ 57'\ 0''.032$.

The value of the obliquity of the ecliptic, as furnished us by Professor Young, of Princeton, is $\omega=23^\circ\ 27'\ 18''.82$; and, therefore, $\angle ZV\Sigma=90^\circ-(V+\omega)=47^\circ\ 59'\ 44''.31$.

Taking into consideration *Refraction* and *Semidiameter*, we have $Z\Sigma=90^\circ\ 50'$. Ignoring the method of solution by *right-angled* spherical triangles, we obtain $\angle Z\Sigma V=28^\circ\ 30'\ 10''.876,=\angle\Sigma$. Therefore, $\frac{1}{2}(V+\Sigma)=38^\circ\ 14'\ 57''.59$, and $\frac{1}{2}(V-\Sigma)=9^\circ\ 44'\ 46''.72$; also, $\frac{1}{2}(v+\sigma)=65^\circ\ 23'\ 30''.02$. Hence $V\Sigma=120^\circ\ 13'\ 11''.21$, and $(180^\circ-V\Sigma)=59^\circ\ 46'\ 48''.79,=L$.

With the number of mean days in Hansen's sidereal year taken as the basis, we have for the Sun's mean daily motion $m=59'.136554,=59'\ 8''.19324$; and in 25 days, we have $25m=24^\circ\ 38'\ 24''.828,=M$.

The *Precessional Slip*, therefore, is $\mathbf{P}=(L-M)=35^\circ\ 8'\ 23''.96,=126503''.96$.

After adopting Struve's constant of annual precession as given in *Young's General Astronomy*, p. 528, $p=50''\cdot264+0''.000227(t-1900)$, and then ignoring the right-hand term, we have $\mathbf{T}=\mathbf{P}/p=2516.79$ years, or 2517 years, to be counted backward (*into the past*) from January 9, 1895, in order to determine the time of Thales.

This count brings us to January 9, 622 B. C. Dividing by the Struvian constant of *mean* annual precession, we have January 9, 628 B. C. Dividing also by the *corrected* Bessellian constant of annual precession, $50''.2479$, we have January 9, 623 B. C.

According to the *Encyclopædia Britannica*, Thales of Miletus lived from 640 B. C. to 546 B. C.; and on May 28, 585 B. C. occurred the total eclipse of the sun, which he had predicted many years before its occurrence.

ARITHMETIC.

Conducted by B. F. FINKEL, Springfield, Mo. All contributions to this department should be sent to him.

SOLUTIONS OF PROBLEMS.

52. **Proposed by F. P. MATZ, Sc. D., Ph. D., Professor of Mathematics and Astronomy in Irving College, Mechanicsburg, Pennsylvania.**

By selling a horse for H=$150 cash, I gain $p=20$ per cent. At what price should I sell the horse and wait $d=90$ days, money worth $m=6$ per cent., in order to gain $q=25$ per cent.?

Solution by the PROPOSER.

Obviously the *cost* of the horse is $C=\left[1 \,/\, \left(1+\frac{p}{100}\right)\right]$ of $\$H,=\$125$;

and, consequently, the *selling price*, in order to gain q per cent., must be $P'=\left(1+\frac{q}{100}\right)$ of $\$C,=\$156.25$, which must be divided by the *proceeds* of $1 for d days at m per cent.; that is, the *required* result becomes

$$P=\left(\frac{100+q}{100+p}\right)\left(\frac{36000}{36000-dm}\right)\text{of } \$H,=\$158.62944.$$

Also solved by *H. C. WILKES.*

53. **Proposed by P. S. BERG, Larimore, North Dakota.**

$500. WOOSTER, OHIO, September 2nd, 1886.

One year after date we, or either of us, promise to pay to the order of J. M. W. Five Hundred Dollars for value received with interest at 7 per cent. from date.

J. C.
M. C.

Endorsed, May 13, 1893, $75.00.
" September 1, 1894, $300.00.
What was due April 1st, 1895?

Solution by H. C. WILKES, Skull Run, Virginia.

As the first payment $75 is less than the interest then due, compute the interest to the time of the second payment.